

# The American Observer

*A free, virtuous, and enlightened people must know well the great principles and causes on which their happiness depends. -- James Monroe*

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## United States Faced By Steel Shortage

**Intensive Nationwide Drive for Scrap Essential to Success of War Program**

### LAG IN PRODUCTION IS SEEN

**WPB Acts to Prevent Waste and to Provide More Efficient Use of Resources**

Last week all over the nation American citizens were searching their attics and basements, their farm sheds and back yards, for every bit of scrap iron and steel they could find. Even small objects like keys were eagerly collected, for scrap steel had suddenly become as precious as aluminum. For lack of it steel mills were running well below capacity, and for lack of it war plants were slowing down and even in some cases closing their doors.

On the admission of WPB itself, the United States this year could use 48,000,000 more tons of finished steel than it will get. For every five tons of steel produced, there is a demand for nine. The steel mills themselves, with a total annual capacity of almost 92,000,000 tons of steel ingots, will produce this year at most 86,000,000 tons.

### A Growing Problem

It was not until late last summer that the American people became vaguely aware that something was wrong in steel production. They heard that a contract for 200 badly needed Liberty ships had been canceled, ostensibly for lack of steel. They learned with dismay that production of all kinds of weapons was not up to the schedule necessary if we were to reach the President's goals. They saw vital assembly lines slow down to a standstill for lack of supplies—a truck plant in New York, a gear and axle plant in Detroit, six shipways in Richmond.

The reasons for this deplorable shortage are, as usual, tangled and complex. Partly it is due to failure to plan adequately for production requirements. War factories have proved to be able to "chew up" steel faster than was expected, and they have literally outstripped steel production. Thus there is a lack of balance in the whole war production program.

Partly, also, it is a matter of hoarding. While some plants are closing down for lack of materials, others have stored away an estimated total of 15,000,000 tons of steel—three to four times the customary supply.

The blame for this situation must be laid partly at the door of WPB itself. There is still much steel being wasted building factories which will never run because there aren't enough materials to supply them; in warships which cannot possibly be used until 1946; in lavish and extravagant fittings for naval vessels, barracks, and warehouses; and in

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The mountain and the molehill

DOWLING IN N. Y. HERALD-TRIBUNE

## Mental Clumsiness

By Walter E. Myer

A young man whom I know was talking the other day about Japanese atrocities, was telling what he had read about the way prisoners of war in Japan are treated. It was quite all right for him to discuss this matter, or it would have been under ordinary circumstances. But not this time, for one of the persons to whom he was talking was a woman whose son had been captured in the Philippines and who was then in Japanese hands. She was worried about it almost to distraction, but for the moment was thinking of other things, when the tragedy was again brought to her mind.

Charles, for that was the young man's name, would not have caused this woman pain intentionally. He was a kindly, sympathetic fellow. But he just didn't stop to consider what the effect of his words would be. He was always doing something of that kind. The other day he was talking, in the presence of elderly people, about the tragedy of growing old. I once heard him talk excitedly about the good times he and his friends had had on a little vacation trip, unmindful of the fact that one of the members of the group had not been invited. I have heard him explain the disadvantages under which one would labor if he didn't go to college, when one of his listeners was a boy whose financial situation was such that college was out of the question for him.

Yes, Charles is well-meaning enough, but in spite of good intentions he is always hurting people. He is unpopular and doesn't know why. His trouble is that he is not mean or vicious but that he is thoughtless.

What can be done about a case like this? Well, there isn't any easy solution. What Charles needs to do is to think of the effect of his words on those who hear them. One must be intelligent to do this. He must be alert, must be able to survey a situation in a lightninglike flash of the mind and then adapt his words and conduct to the circumstances. He can still be candid and forthright. He need not be evasive or hesitant. But he must match good intentions with thoughtfulness. This isn't an easy thing to do. Some people seem especially insensitive to their surroundings. Perhaps they are just naturally obtuse. Possibly it is merely a matter of training, of mental discipline. I am not sure about it. But I have seen clumsy, awkward boys and girls develop grace and poise when they gave their attention to it. Surely mental clumsiness is equally curable. Try as we may, none of us will reach perfection. We will slip occasionally—make remarks we would give worlds to recall. But with fair intelligence and strong determination one can avoid the persistent boorishness which contributes so much to unhappiness and irritation.

## Tension With Vichy Grows More Acute

**Hull Protests Laval Decree Forcing Frenchmen to Work in German Factories**

### ANGER RISING IN FRANCE

**Underground Movement Grows as 90 Per Cent of People Oppose Vichy Policy**

France was supposedly knocked out of the war more than two years ago when she laid down her arms and signed the armistice with Germany. Yet never a day passes without revealing that France is still playing an important role in the war—a role which is likely to become more vital with each passing month.

Last week, there were signs on a dozen fronts that France was stirring. In Paris, German military officials in a single day executed 116 Frenchmen for having made attacks upon Nazi occupation troops in the city. These executions were, as usual, explained as "reprisals" against "Communist terrorists." Throughout that part of France which remains under German occupation, a virtual reign of terror is maintained by the Nazis in order to keep the rising tide of anger in check.

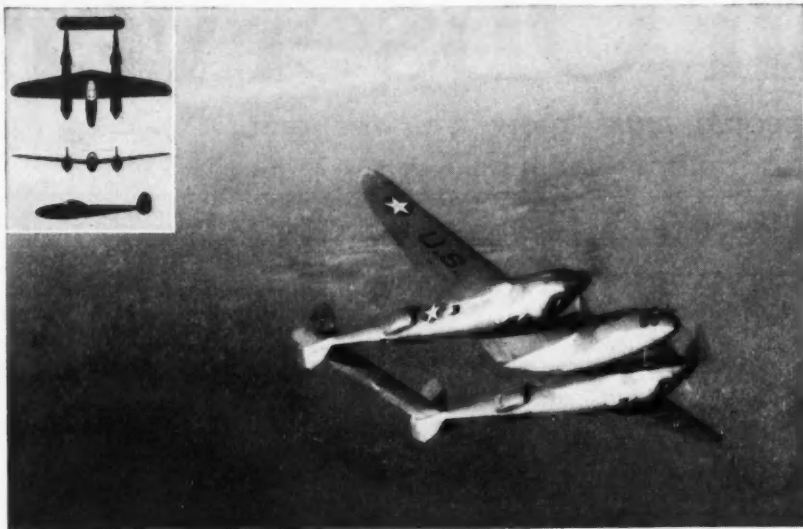
### Great Strains

At the same time, conditions in Unoccupied France are hardly better. A bitter tug-of-war between Pierre Laval and his opponents is being waged to swing all France behind the German war effort. A new campaign against the Jews is in progress. Drastic rules have been laid down for compulsory labor. New diplomatic strains have been created between the government at Vichy and the United States. The strain had become so great last week that many of the diplomatic niceties were ignored and a complete rupture in relations was freely predicted.

Meanwhile, reports came from London last week about another France, the Fighting French, who follow the leadership of Charles de Gaulle. This group includes those Frenchmen who have succeeded in escaping from France and who are actively fighting the Axis wherever the opportunity presents itself. It also includes the millions of Frenchmen who still live in France—in the Occupied and the Unoccupied parts of the country—who are working against the Germans, seizing every opportunity to achieve final victory. It includes the vast underground movement, daily becoming more effectively organized, which uses sabotage, propaganda, and every available means to help the United Nations. Two leaders of the underground movement reached London and reported that 90 per cent of the inhabitants of France support de Gaulle and the United Nations and are only awaiting the opportunity to rise up against their oppressors.

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U. S. ARMY AIR FORCES PHOTO

## Planes in This War

## Lockheed P-38—or "Lightning"

By Captain John Gordon Studebaker, U. S. Army Air Forces

THE Lockheed P-38 is one of the Army Air Forces' most efficient interceptor fighter planes. The purpose of this type of aircraft is to keep the enemy from obtaining valuable information by air observation and to prevent hostile bombers from reaching their objectives. Fighters are also used to provide a protective convoy for friendly aircraft, and they are amply armed to shoot down enemy fighters.

To accomplish all these tasks, the P-38 combines rapid climb, high speed, and maneuverability with deadly firepower. Its two 1,150-horsepower, liquid-cooled, 12-cylinder Allison engines will make it climb at the rate of a mile a minute. Turbo-superchargers enable the engines to "breathe" more rapidly as the plane reaches the thin air at high elevations, and to maintain maximum horsepower over a wide range of altitudes. Thus, it can fight as well at 30,000 feet as it can at lower altitudes.

With a top speed of over 400 miles an hour, the P-38 is rated the fastest military plane in the world. The

English were so struck with its terrific speed that they promptly dubbed it the "Lightning." Armament—including one 37mm. cannon and four .50-caliber machine guns—bristles from its nose. These guns fire in a straight line instead of converging in a cone, as is the case with wing-mounted guns.

A large single-place fighter, the "Lightning" weighs approximately 14,000 pounds when loaded. It has a wing span of 52 feet and an overall length of 38 feet. Its two three-blade propellers rotate in opposite directions to insure balance. A tricycle landing gear facilitates safe take-offs and landings, even on rough, hastily constructed fields. The plane is unusual in appearance, having a central nacelle which contains the pilot's cabin and which lies between the twin booms that carry the engines. The long booms support a split-tail assembly, making the plane easy to identify.

Numbers of P-38's are being used by the Fighter Commands which protect America's shores against possible invasion by air. With a range of from 800 to 1,200 miles, depending on the speed at which it is flown, this aerial skyrocket was initiated into actual combat during the Battle of the Aleutians.

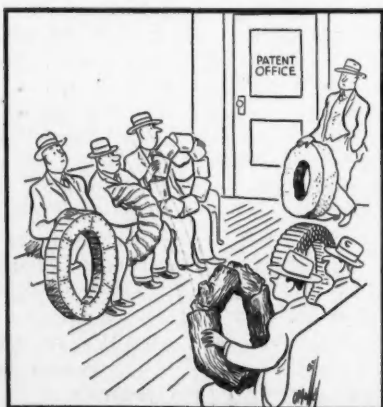


Capt. Studebaker

## S M I L E S

City Dweller: "Why are you running that harrow around the grain field?"  
Farmer: "I'm raising shredded wheat this year."  
—TEXAS RECORDER

Then there's the Scotchman who took his son out of school when he found the lad would have to pay attention.  
—CLASSMATE



O'MALLEY IN COLLIER'S

"An anonymous person," explained the teacher, "is one who does not wish to be known." Just then she heard a commotion at the back of the room and asked, "Who is making that noise?"  
"An anonymous person," came the reply.  
—CLASSMATE

An old lady, riding in a taxi for the first time, noticed that the driver kept putting his hand out every few minutes. After several left-hand turns, she said sharply: "Listen, young man, you keep your hands on the wheel. I'll let you know when it's raining."  
—SELECTED

"How about a nice pair of book ends?" suggested the salesgirl to the puzzled shopper who was looking for a gift.

"Good!" exclaimed the shopper. "I didn't know you could get them. My friend always reads the end of a book before the beginning."  
—CLASSMATE

"Yes, he must be a very fast runner," explained the woman who was proud of her athletic son. "Look at this newspaper report—it says he fairly burned up the track yesterday."

"And it's quite true," she added. "I went to see the track this morning, and it's nothing but cinders."  
—LABOR

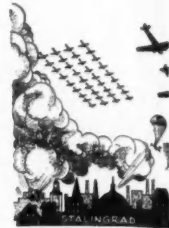
## Sidelights on the News

AS the Battle of Stalingrad continued to rage with unabated fury last week, the world saw in it a titanic struggle between the wills of two men—Adolf Hitler and Josef Stalin. To Stalin the city is a symbol, a symbol of himself, for the name means Stalin's city. He had given the order that it must be held at all costs. Hitler had also given the order that the city must be taken, however great the cost. Thus the battle represents a clash of two of the strongest wills of history. Anne O'Hare McCormick, writing in the *New York Times*, speaks of the conflict as follows:

One can imagine the uncontrollable rage of Hitler, racked as he is by storms of anger whenever his will is balked, at the granitelike opposition of Stalin, the Great Obstacle in his way. No doubt he is determined to break Stalingrad at any sacrifice of German lives if only as a way of breaking Stalin.

Stalin does not fly into rages. He has no nerves. He acts by instinct but not by impulse. If anger moves him, and it is never apparent, it is as cold and implacable as the movement of a glacier. Yet, if anything could be stronger than Hitler's hatred of Stalin, it must be Stalin's hatred of Hitler. The treachery of Hitler forced Stalin into the war he tried by every manoeuvre to avoid; Hitler wrecked Stalin's policy and ravaged the best part of his country. . . .

Stalingrad is not worth the cost that must be paid to take it or to hold it. But in all great battles more is involved than the armies locked in combat. The fates and furies are engaged—the passions of peoples, the will and ambitions of leaders, the inhuman forces of history. In this sense Stalingrad, while not a decisive battle because Russia can stand on a hundred lines beyond the Volga, is one of the epic battles of the war.



HOW great have Russia's economic losses been during the 15 months she has been at war with Germany? A. Yugow attempts to answer this question in *The New Republic*. According to Mr. Yugow, Russia has lost slightly more than half of its 1939 output of coal. The previous output of iron ore has been reduced by more than half. "The USSR has lost no less than 53 per cent of its production of steel and cast iron, and no less than 40 per cent of its machine-building industry, including tank factories."

Many of the richest agricultural lands of Russia are now in the hands of the Nazis. "It has lost about 45 per cent of its wheat (especially winter wheat), 75 per cent of its barley, 60 per cent of its vegetable oils, 90 per cent of its tobacco."

The greatest hope of survival lies in the establishment and extension of new industrial areas east of the Volga. And in the areas not occupied by the enemy, the people are working as never before. Mr. Yugow writes:

The workers and the peasants of the whole Union are working in factories and on collective farms as they have never worked before. They know that every ton of coal or grain, every tank and every shell which they produce, contributes to the defense of their country, to the freedom of their future generations. The Soviet press carries many announcements of the increasing productivity of workers and peasants. . . . The whole Russian people stands at the front line, defending its country, fighting for its national and social freedom.

MORE and more, the Congress of the United States is being subjected to sharp criticism. It has been accused of frittering away its time, of playing politics, of being more interested in winning votes than in winning the war. Whatever truth or lack of truth there may be in these charges, the fact is that Congress is frequently slow to act upon matters of vital importance. The *New York Herald Tribune* calls our Congress "archaic" because it has refused to reorganize itself along modern lines. Both the executive and the judicial branches of the government have undergone considerable streamlining to meet the complex problems of the present, and the *Herald Tribune* calls upon Congress to do likewise:

The most glaring defects in the present-day Congress are those which it has allowed to grow up by custom or inertia, and which it could quite easily cure by its own action. The committee system in its present form is unendurably ponderous and archaic. The power of investigation, which could be one of the most incisive tools of modern government, has been frittered away in reckless, uncontrolled, and confidence-destroying headline hunts. Committee appointment by seniority has become a scandal. . . .

Finally, there is the curious division of labor, sanctified by hoary rules, which in effect compels the House to vote without argument and frees the Senate to argue without ever coming to a vote, gravely reducing the dignity and effectiveness of both chambers. These are desperate times, which are trying not only the souls of men but the adequacy of their institutions; and there is no doubt that the Congress, living as it has been in outworn habits and rules, has been dangerously losing ground in that trial. Dangerously, because there is no thoughtful citizen who does not want a powerful and competent legislative branch. But if we are to have one, the Congress itself must first of all look within its own heart.



THE September issue of *Harpers* contains a number of excerpts from the diary of Bella Fromm, former society reporter for leading German newspapers. These items deal with the last days of the German republic and the early days of the Hitler regime. Here is Mrs. Fromm's account of her first meeting with Hitler, at a reception given by Franz von Papen, then vice-chancellor and now Nazi ambassador to Turkey:



Suddenly . . . black SS men studded the place. I looked on in amazement. They had not been there a minute before. Now things went on as though on a revolving stage. Folding doors were flung grandly open. There was a moment's silence and Adolf Hitler made his entrance.

Adolf paused. A plain-looking little man. The coattails well cut, in fact better than the head, which seems out of drawing, as if it did not belong with the rest of him. . . .

I saw Adolf throw a glance in "Thomy's" direction for a cue as to just what to do next. Then I saw him try out the slippery floor with a tentative Nazi toe. Gathering his resources, his coattails flapping and his body moving forward dynamically, he dashed right in the direction of our group.

My first impulse was the animal one of self-preservation. I wanted to scramble away. But already the Fuehrer was bent over Martha von Papen's shaking hand. My attempt at a retreat had attracted Adolf's attention. He came to me. I was rooted to the spot.

"May I have the pleasure of bidding you good evening, gnädige Frau?" he cooed. He seized my hand, pressed it to his lips, and presented me, gratis, with one of his famous hypnotic glances.

It did not seem to work on me. I felt only a slight nausea. . . . Weird ideas flashed through my mind. Why did I not have my little revolver with me? Then I realized that he was asking me polite questions. That I really ought to give him polite answers.



# Student Victory Corps

ON September 25 President Roosevelt made an announcement of great importance to the high school students in the United States. He told of plans which are being made, with the endorsement of the Army, the Navy, the War Manpower Commission, and the United States Office of Education, for the establishment of a High School Victory Corps.

It is hoped that the Victory Corps will be organized in senior high schools throughout the country. Both boys and girls are eligible. The purpose is to encourage the most effective preparation for participation in wartime activities. While it is hoped that members will include most of the students in the nation, enrollment in the Corps is to be voluntary.

The idea behind this movement is that all the young people of the nation should be doing something to help win the war. They may do this by taking training which will give them greater skill if later they should join the armed forces, or which will make them more effective in industrial work—in helping to produce armaments, guns, tanks, planes, jeeps, ammunition, or goods necessary for civilian life.

## Training Needed

If a young man is to serve in the armed forces, in the Army, the Navy, the Marines, the Air Forces, he wants naturally to be as effective as possible. It is important from the standpoint of the government that he be competent. This means that he should have training before he enters the services, for much of the work to be done in an Army is of a highly skilled character. Out of every 100 soldiers, 63 are specialists: mechanics, machine gunners, radio operators, cooks, sanitary technicians, nurses, motorcycle drivers, motor repairmen, etc. At the present time the Army is in very great need of such specialized workers as these, and advance prep-

aration for work of this kind can be taken by young men before they enter the services.

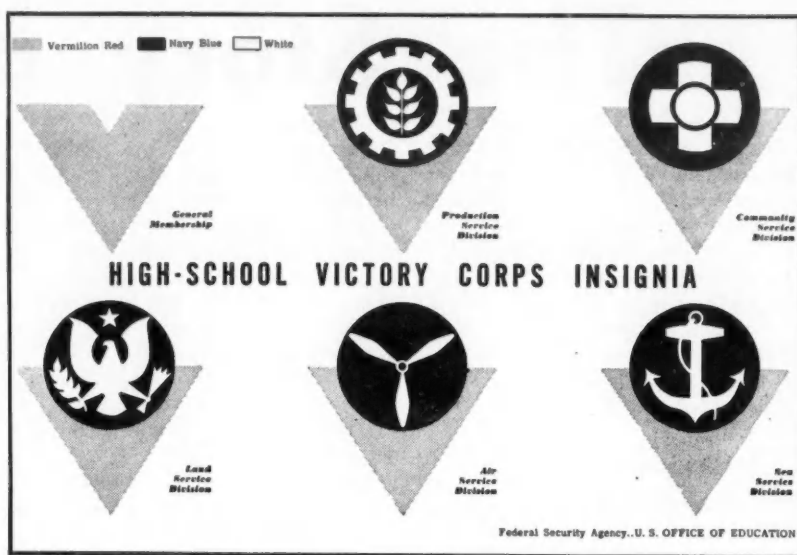
There is also a heavy demand for both men and women in war production. The War Manpower Commission reports that a force of 20 million persons in direct war production and transportation will be needed in 1943, and that 12 million workers will be needed on the farms. Since many able-bodied young men will be in the armed forces, much of the work in industry must be done by girls and women.

The 28,000 high schools of the nation, with their 6,500,000 students, can do a great deal to train the young people for the work they are to do and to get them started in the right kind of activity. But to accomplish this, there must be organization and planning, guidance and direction. That is why the High School Victory Corps is being established.

The plan is that a Victory Corps be established in each high school. The high schools will then affiliate their groups in a great nation-wide organization. Any student may apply to the principal of his school for membership. To be accepted as a member, he must meet certain requirements.

Among the requirements are these: The student should be participating in a school physical fitness program. He should be a student in good standing in his school, and should be participating in at least one wartime activity, such as air-raid warden, fire watcher, or other civilian defense activity; U. S. O. or Red Cross volunteer work; scale model airplane building; participation in health services; part-time employment in farm or industrial work; school, home, community services such as salvage campaigns, care of children of working mothers, gardening, book collecting, etc.

After the students of a school have



Insignia for the new High School Victory Corps

been organized into a Victory Corps, the membership is broken up into five divisions:

- Air Service Division
- Land Service Division
- Sea Service Division
- Production Service Division
- Community Service Division.

If a student intends to work with the air services, either as a pilot or a member of a ground crew, he will join the Air Service Division. He should have taken or should plan to take at least three of the following:

- a. One year of physics or three years of mathematics.
- b. A course in pre-flight aeronautics.
- c. A course in automotive mechanics, radio, electricity, or vocational shop course which gives preliminary preparation for the servicing, maintenance or repair of airplanes.
- d. He must be participating in a program of physical fitness.
- e. He must be participating in a program of military drill.

If one intends to join the land forces, he will join the Land Service

Division and will take three of the following: Mathematics, science, physical fitness, one special preinduction course, a shop course, military drill.

One who joins the Sea Service Division must prepare along three of these lines: High school mathematics, preferably plane trigonometry; laboratory science, preferably physics; physical fitness; a course in elements of navigation; a shop course; military drill.

Members of the Production Service Division must have plans which include three of the following: agriculture; vocational course in trades and industry; physical fitness; must have engaged or be engaged in part-time work, either paid or voluntary; military drill.

Members of the Community Service Division should be making preliminary preparation in community or other service occupations such as teaching, social work, medicine, nursing, dentistry, librarianship, or other professional services, stenographer, typist, bookkeeper, salesman, homemaking, child care, home nursing, or nutrition. He must be engaged in studies preparing for work along one of these lines. He must be engaged in part-time work, must be participating in a program of physical fitness, or he may be participating in a program of military drill.

## Corps Insignia

An attractive insignia has been designed for each of these divisions, and may be worn on a Victory Corps cap or armband, front pocket or sleeves of shirts, blouses, or sweaters. Announcement will be made later in these columns concerning the insignia.

It is expected that all members of the High School Victory Corps will engage in citizenship studies. They should study the meaning of the war, the facts of the war as they unfold, and problems pertaining to it. It is recognized that one of the most important responsibilities of the schools is the training of youth for citizenship in a democracy, and that this responsibility is particularly heavy in wartime.

Victory Corps news, reports of what is being done in schools throughout the country, and the general story of the movement as it develops will appear from time to time in THE AMERICAN OBSERVER, and also in the Weekly News Review, Our Times and Scholastic, publications in the senior high school current history field.

# Straight Thinking on the War

By CLAY COSS

"It really doesn't make much difference whether we win or lose the war—we're going to be in a terrible mess either way." From time to time, this view is expressed. Many individuals are falling into a spirit of defeatism, gloom, cynicism. They point out that the nation, after the war, will be loaded down with a stupendous debt of unpayable proportions; that destruction throughout the world will be so great as to cause widespread chaos; that only force, regimentation, and dictatorship can achieve and maintain order under such circumstances; that democracy cannot survive.

Defeatism, of course, is no new thing. At every difficult period in human history, there have been dispensers of gloom. There were defeatists aplenty in England who believed the colonists going to America were headed straight for their doom. Later, there were large numbers of defeatists among the colonists who thought there was no hope of establishing and maintaining an American republic in a world of monarchies.

And so it has been throughout

history—a struggle between courage, faith, and vision, on the one hand, and defeatism, gloom, and cynicism, on the other. Fortunately, there have been enough Americans with the former qualities that our country has forged



ahead to ever-higher goals. In fact, a leading historian contends that one of the major factors in America's unprecedented progress has been the strong faith of the people in progress. Unlike most peoples of the past, Americans have merely assumed that conditions were certain to improve from one generation to another, and conditions have steadily improved.

Thus, it is undermining one of America's finest traditions to adopt a defeatist attitude. Moreover, it is a form of poor sportsmanship. It is the typical case of the person who is all right so long as everything is going smoothly, but who cannot take it when the sailing gets rough. Today, it is more than poor sportsmanship—it is unpatriotic to express such feelings even if one has them. For defeatism is contagious, and if too many people come to feel that the future is hopeless, it will seriously impair their efforts toward winning the war.

Defeatists should, but unfortunately don't, blush with shame when they reflect on the faith, the courage, the will to fight and die shown by the defenders of Stalingrad; by the Americans and Filipinos at Bataan; by the Americans at Wake and Midway Islands; by the British at Dunkirk; by the Greeks and other heroic peoples who are engaged in this struggle to prevent the forces of tyranny and retrogression from throwing civilization back into the Dark Ages.



# The Story of the Week

Readers of this paper are urged to keep back numbers available for use, since reference is frequently made to subjects which have previously been discussed. It is especially important that the large maps be saved. The full page maps which appeared in the issues of September 7 and September 14 should be used in connection with the account which follows of this week's developments.

## At Stalingrad

The greatest battle of all human history still rages at Stalingrad. Hundreds of thousands of men are fighting in the streets and suburbs of



Two attitudes  
SHOEMAKER IN CHICAGO DAILY NEWS

that once great but now ruined industrial city. Much of the fighting is hand to hand. With guns, hand grenades, bayonets, the seething mass of men, and in some cases women and children, struggle for little gains here and there, for houses, streets, the vantage point of some pile of ruins. It is impossible for those of us who have not witnessed such a thing to imagine the pain, the anguish, physical and mental, the stark terror of this grim battle which goes on day and night, week after week, in the Stalingrad sector.

Last week the Germans announced that the fall of the city was a matter of hours. The hours passed. Days passed, and the defenders fought on. They even made some gains, wiped out spearheads that the Nazis had driven deep into the heart of the city. Then from somewhere came Russian aircraft, attacking the German planes which, flying low, have been bombing the city at will. Detachments of Russian soldiers from Western Siberia arrived. Throughout the United Nations people were wondering whether, almost miraculously, the city might be held.

Military experts still thought this unlikely. The odds are strongly against the heroic defenders—against us, for the fall of Stalingrad, if it comes, will be a blow to the United States and all our Allies as well as to Russia.

## What It Means

If the Russian army is forced out of Stalingrad, it must retreat about 200 miles before it finds cities large enough to accommodate an army, and a position suitable for an army to re-form its ranks and make a stand. It would take the army quite a while to get back into shape to fight. The

Germans, freed from the danger in the Caucasus region, would probably be able to withdraw a large number of their men, perhaps half a million, for use elsewhere. They might send a large part of this force to Egypt. We can imagine what that would mean when we reflect that it is all the British and their Allies can do to hold Rommel with his present forces. If he is heavily reinforced, the Egyptian situation may become very dangerous.

The Germans might, instead of going to Egypt, drive on to the Caspian Sea, and then, following the Caspian coast line, reach the great Russian oil fields of Baku. They might also be able to transfer planes and perhaps soldiers to the western front to ward off the anticipated attack by the British and Americans.

If they take Stalingrad, go on down the Volga River to Astrakhan, closing the gap between the Caspian and Black Seas, they can block the shipment of supplies from the United States and Great Britain to Russia; that is, the supplies reaching Russia from the south. The only other supply line left would be the one to Murmansk and Archangel in the north, and this is an extremely dangerous route because of the attacks on the convoys from German submarines and planes.

The Germans have already won a great advantage in their Russian campaign. They have captured the oil fields of Maikop and are near the larger fields of Grozny. This is a tremendous boon to them, for they were undoubtedly running very short of gasoline and lubricating oil. Just how short, we do not know, but in the very well-informed quarters it is believed that the supply of gasoline and oil in Germany is so low that it cannot last more than six months.

But the Germans now have the Maikop fields. The Russians have done all that they could to destroy the wells and refineries, but these can probably be replaced in about six months—probably in time to save the Germans from collapse due to the lack of oil. It will be a hard job to put the fields back in shape and to transport the oil, but the Nazis have been making preparations. They hoped a year ago to obtain these oil fields and had machinery ready to



RUBBER CZAR. William M. Jeffers (right) newly appointed Rubber Administrator, talks over his new job with Donald Nelson.

go to work on them at once. They were halted short of the oil fields last year, but they kept the machinery ready and it is now being put to use. The victories already won by the Germans, therefore, may prolong the war for a very long time.

This danger, however, confronts the Nazis: If they do not take Stalingrad, if the Russian armies can somehow manage to hold that position, then the Russians may attack the stalled Germans on their left flank; that is, from around Voronezh. It is conceivable that this attack might threaten the German line of communications and compel them to retreat, giving up the gains of the summer. Much, therefore, hinges on the result of the fighting along the Volga.

## Allied Misunderstandings

It is unfortunate that bad feeling has developed between the Russians on the one hand and the British and Americans on the other. The Russians think that they are being let down, that the British and Americans are not doing all that they might to help. They understood that a second front was to be established this year. They interpreted statements made by the British and American governments to mean that this would be done. They are bitterly disappointed that it is not being done. It is now known that the recent conference between Churchill and Stalin was not completely harmonious, that Stalin felt strongly that the second front should be attempted.



DIEPPE was a costly operation as Canadian figures of losses sustained reveal. This is a picture, from German sources, of a Commando tank left behind in Dieppe.

This attitude on the part of the Russians is understandable. When a man is about to drown, he feels that his friends should try to save him and that they should not count the cost and dangers too closely in coming to his aid.

The refusal of the American and British governments to launch a second front at this time is also understandable. The raid at Dieppe gave some indication of the difficulties that would be encountered in attempting an invasion. The Canadians, who bore the brunt of that attack, lost two-thirds of the forces engaged. Two-thirds of all the men who went out on that raid failed to come back. They were either killed or taken captive. The entire coast line bristles with defenses, deep defenses extending back miles and miles into the interior. And even if a portion of France were taken, there would remain the German West Wall, the formidable line of defenses established before the war. And the French Maginot line has been turned to face westward. Both of these lines of fortification would have to be stormed before Germany could be invaded.

## South Pacific Front

Russia is not the only critical theater of war. Decisive battles are raging in the Solomon Islands and New Guinea. The Japanese have



The Solomon Islands

never conceded the Solomon Islands to us. That outpost is too important to give up without an all-out struggle. If the Japanese retake the Solomon Islands, they will be in a position to make dangerous attacks upon our supply line to Australia. If we hold the Islands, we can make dangerous attacks upon any expeditions the Japanese send against New Guinea and Australia.

So, though we do not read much about it, fighting is going on constantly in the Solomons, especially the Island of Guadalcanal. Our Marines are busy day and night. They are fighting under very difficult conditions, against snipers, against air attacks, against Japanese destroyers and submarines which shell their positions. A report to the New York Times says:

Darkness brings complete blackout on Guadalcanal and nobody wanders around much because nobody wants to be shot as a Japanese sniper. Sniping seems to come in spurges, and some nights the perimeter resounds with shooting for hours as Marine patrols catch roving Japanese.

Life is reduced to essentials and Guadalcanal's greatest pleasure is just in still being alive, in mail from home, in nighttime camaraderie around radio programs from home, in group singing of all songs that have become American folk music.

Men sleep with their jobs—gunners



with their guns, drivers with their trucks and jeeps. Mosquito nets are a necessity against anopheles. It rains almost every night—weepy tropical rain soaks into the bed rolls and seeps through tarpaulin. The nights are passed in wet chill and discomfort and the days in mud and filth that the Marines, who have been too busy fighting, have not had time to clean up. . . .

The sacrifice which has gone into the taking and holding of the Solomon Islands will probably be in vain if the Japanese forces go southward through the mountains and the jungles of New Guinea, and capture Port Moresby. If this happens, they will be established on the flank of the Solomons. They will have a base for air attacks and the Solomons probably cannot be held. Furthermore, the Japanese will be in a position to attack Australia. The battle for Port Moresby is, therefore, a contest of very great importance.

### Battle of Production

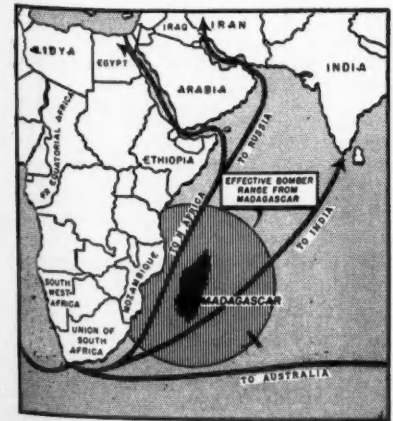
President Roosevelt says that we are producing war materials at a rate only about half of our capacity. In proportion to population and facilities for production, we are not doing anything like so well as the Russians and the English are doing. We must speed production of war materials, shutting off the manufacture of all civilian goods not absolutely essential.

Steps are being taken to get more men and women into essential war work. A rule has been made by which federal employees may be shifted, even without their consent, from one branch of government work to another. This affects 2,300,000 government workers.

Controls are being extended also to workers in private industry. A difficult situation was developing in certain western states which mine copper, lead, and zinc. The workers in these metal industries, so essential to war, were leaving in large numbers to take positions where they could earn more money. It is said that 20 per cent of the metal workers in Utah and Idaho have been drained away from their work and copper production is falling off.

Now comes the rule that if any of these men leave their jobs without getting the consent of the United States Employment Service, they will be classed 1-A and be subject to induction in the Army. It is possible that this rule may be extended to other industries.

The War Labor Board has eased the situation for the metal workers in these western states by granting them an increase of wages. This has been done on the ground that if the men are required to stay at their jobs because of the essential nature of their work, they should have as high wages as they could have obtained elsewhere.



The importance of Madagascar



NEW GUINEA NATIVES carry supplies to U. S. troops on the New Guinea front. Supplies are carried by trucks to where foot trails begin and from there the natives, each carrying about 40 pounds, do the hauling.

In some quarters this ruling is attacked. The argument is that laborers should not require extra rewards in order to work at essential war industries. They should keep on with their jobs, it is said, as a matter of patriotism. It is only fair to say, however, that it is a very common practice of owners of industry to hold out for as large profits as they can possibly get before signing contracts with the government to make war materials. It would be a mistake to assume that any one class of the population has a monopoly on patriotism or that the desire for rewards in wartime is confined to any one class.

### Rubber Czar

William M. Jeffers, president of the Union Pacific Railway System, has been named by Donald M. Nelson, chairman of the War Production Board, as the man who is to handle the rubber problem. His job is to put into effect the recommendations

of the Baruch Committee. (See THE AMERICAN OBSERVER, September 21.)

The new "rubber czar" will decide when and to what extent gasoline rationing on a national scale shall be adopted as a means of saving rubber, and what agency, such as Office of Price Administration, or Office of Defense Transportation, shall put the plan into effect. He will supervise plans for establishing and enforcing speed limits and other measures of rubber conservation. He will also have charge of the production of synthetic rubber.

Mr. Jeffers began his career as an office boy and rose to the headship of one of the nation's great railway companies. He has said that he would rather be head of the Union Pacific than President of the United States, but he gave up the job to take over the work of supplying the nation's rubber requirements. He is regarded as a very competent executive, is a conservative in politics and an opponent of the New Deal.

## News From All Fronts

Henry Kaiser, the miracle man of ship-building and dam construction, has been given the government order he sought to build cargo planes. At a cost of \$18,000,000, he is to build three giant experimental cargo planes—the first to be completed in 15 months, the second in 20, and the third in 25. At the same time, he is to draw up plans for a factory in which such planes could be produced in quantity if they are needed.

Much as the Japanese dislike using the English language, they are being forced to recognize it in their war effort. It is the only foreign tongue spoken by some of the natives in the areas of Malaya and the South Seas which the Japanese have conquered.

Money spent for the war program is mounting steadily. From July 1940 to the end of August this year, the total was \$44,741,000,000, according to the War Production Board. The daily rate of spending had climbed from \$184,000,000 in July to \$199,300,000 in August. Even this staggering rate of expenditure is by no means the peak, for the daily sum will mount steadily next year.

Germany is reported to be sending a new type of sub-stratosphere bomber on daylight raids over Britain. Equipped with supercharged motors, the stratobomber can fly at 40,000 feet. Another new German plane is

the Heinkel 177, which carries eight tons of bombs—the same capacity as that of Britain's new Avro-Lancaster.

The Solomon Islands, where hard fighting between American forces and the enemy still continues, were named by the Spaniard who discovered them in 1567. He hoped people would think that King Solomon had obtained his gold from the region and thus would be encouraged to go there.

War Ration Book No. 2 is now on the presses at the Government Printing Office. An all-purpose book, it is designed to permit the Office of Price Administration to ration new commodities at a moment's notice simply by designating which page of coupons shall be used. It is expected that the book will be distributed throughout the nation before Christmas.

### Pronunciations

Astrakhan—as-trah-kan'  
Baku—bah-koo'  
Darlan—dah-lahn'  
Dieppe—dee-ep'  
de Gaulle—duh' gol'—o as in go  
Grozny—groz'nee—o as in orb  
Herriot—ay'ree-oe  
Jeannemey—zah-neh-nee'  
Laval—la-val'  
Maikop—mi'kop—i as in ice, o as in off  
Murmansk—moor-mahnsk'  
Pétain—pay-tan'  
Rouen—roo'ahn'  
Toulouse—too'looz'  
Vichy—vee'shee  
von Papen—fon' pah-pen  
Voronezh—voo-roe'nyesh

## WAR STAMPS

Buying one 10-cent war stamp may not seem like an important contribution to the war program. But when these individual purchases are multiplied by the thousands, and even millions, they add up to an impressive amount of money for the government to use in fighting the war.

When the government sells these stamps, it can take one of the dimes to buy five cartridges for a .45-caliber pistol. The money obtained from two 10-cent stamps will purchase one cartridge for a large anti-aircraft machine gun. The sale of three stamps will furnish money for one bag in which messages can be dropped from an Army plane. Or the 30 cents may be used to purchase two pairs of socks for a soldier.

Many of the weapons and materials which the Army and Navy require, of course, cost a great deal of money. The price of a single military motorcycle is \$400, but it is paid for when 4,000 people each buy a 10-cent war stamp. As soon as 850 individuals buy a 10-cent stamp apiece, there is enough money to pay for another Garand rifle.

An Army "jeep" costs \$900—or the money from the sale of 9,000 10-



cent stamps. An anti-aircraft searchlight costs \$30,000, or 300,000 10-cent stamps; a pursuit plane, 502,500 stamps; a medium tank, 547,500 stamps; and a Flying Fortress, 3,502,500 stamps.

These are large sums of money, but they are being raised because thousands of individuals are buying the 10-cent stamps, as well as the larger stamps and bonds.

### The American Observer

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WORKERS FOR PRISONERS. Pierre Laval (hat in hand) greets liberated French prisoners who have returned from Germany. French workers were forced to go into Germany in exchange.

## The French Fight On

(Concluded from page 1)

We can see, therefore, that though France was defeated on the field of battle, she remains a vital factor in the war. The French people, stunned by defeat as no nation has been in modern times, are reviving from the shock and working for the day of liberation which they feel sure will come. More and more, they are coming to believe the words which de Gaulle uttered at the time of the surrender in June 1940: "France has lost a battle, but France has not lost the war."

It was the realization of France's usefulness in winning the final victory which prompted the United States to maintain diplomatic relations with the Vichy government—a policy which has brought considerable criticism. Our State Department has been accused of "appeasing" the men of Vichy, men like Pétain and Laval and Darlan who run the government of Unoccupied France. These men are known to be tools of Hitler; Laval has openly admitted that he wishes a German victory and he has used every means possible to throw the full weight of France into the scales on the side of the Axis. Why, then, should we continue to maintain diplomatic relations with the Vichy government?

### Reasons for Policy

The answer to this question has been given by the Roosevelt administration. So long as there was any hope of preventing France from going all out in collaborating with the Nazis, it was well worth the price of remaining at least on speaking terms with the Vichy government. Our purpose was to prevent Pétain and Laval and Darlan from letting the French fleet fall into German hands. Such a development would greatly strengthen the Axis naval strength and might turn the battles on the seven seas against the United Nations. Up to the present time, the French fleet is not in the service of the Axis.

Another purpose of our policy has been to keep the United States as a counterbalance to German influence inside France. American diplomats stationed at Vichy could use their influence to remind the French people that their plight was not hopeless, that the war would eventually be won by the United Nations, and that the day of liberation would come.

Time alone will reveal the wisdom of the policy we have followed toward France during the last two years. It may be that a complete rupture in diplomatic relations will come during the next few weeks. Even so, we will have kept France out of the war as an active belligerent against us and will have gained time in which to build our military machine to effective striking power.

The big issue in our relations with Vichy at present concerns Laval's repeated attempts to put France more in the service of Germany than she has been up to now. The best way France can help right now is to furnish the workers which Hitler so desperately needs to run his factories. The shortage of manpower in Germany is reported to be so acute, as a result of the large numbers of workers who have been shipped off to the Russian front, that the Nazi war effort is threatened.

In order to induce French workmen to go to Germany, Hitler has offered to return to France the prisoners who have been held since the armistice. They were to be exchanged on the basis of one soldier for three skilled workmen. But only a few thousand Frenchmen responded to the call.

Because such an exchange failed to work out on a voluntary basis, compulsion was felt necessary. That is why the Laval government issued its decree making every man between the ages of 18 and 50 and every single woman between 21 and 35 liable to serve at any task deemed "necessary in the superior interest of the nation." This decree fooled nobody. Its purpose was to draft French workers for German industries.

Secretary of State Hull replied to the contemplated transfer of French workers to Germany with perhaps the sharpest rebuke he has yet made to the Vichy government. "This action," he said, "would be of such aid to one of our enemies as to be wholly inconsistent with France's obligations under international law."

In other ways, the United States is getting tougher with Vichy. Our government has protested strongly against the policy of persecuting the Jews in France and of turning many of them over to the Nazis. French Jews have been forced into slave labor, their children placed into what amounts to concentration camps. To

this we have protested without mincing words.

At the same time, Vichy has been told in no uncertain terms that the United States will not discontinue its bombing of French factories which are turning out goods for Germany. When Laval protested against the bombing of Rouen, calling it "odious aggression," the American diplomatic representative at Vichy, S. Pinkney Tuck, said that factories producing for Germany would be bombed "at every opportunity in the future."

It is too early to predict whether these developments constitute a prelude to a complete break between the United States and Vichy France. Many times in the past, during the troubled two-year period since the armistice, relations have been at the breaking point and yet the slender thread of diplomacy has not snapped.

### Rising Opposition

Although held in complete subjection at the present time, the French people are bound to exert a powerful influence upon the outcome of the war in the months ahead. Many of those Frenchmen who thought, two years ago, that France could live in peace and dignity beside Germany have learned through bitter experience that they cannot do so. They have been subjected to the same hardships as the peoples of the other conquered countries. Their foodstuffs have been looted and shipped to Germany. Their factories have been run for the German war machine. Their wealth has been confiscated to the point where they are now practically a bankrupt nation. And now their men and women are about to become slaves of Germany.

Signs of mounting rage among the French are not lacking. Not only are the repeated reprisal shootings, such as those which took place in Paris last week, indicative of the rising anger, but Frenchmen are even speaking their minds. The eloquent protest issued by Edouard Herriot and Jean Jeanneney, reported in last week's issue of THE AMERICAN OBSERVER, has been endorsed by other political leaders who cringe at the policies of the Vichy government.

Another voice of protest, not political but religious, was heard in France a few days ago. It was the voice of the Archbishop of Toulouse who spoke against the atrocities which are being committed against the Jews of France. In a letter sent to French priests which was read in hundreds of pulpits, the Archbishop declared:

There is a Christian morality, there is a human morality, that impose duties and confer rights. These duties and these rights derive from the very nature of man. They may be violated. No mortal has power to suppress them.

That children, women, men, fathers, mothers should be treated as a wretched herd, that members of the same family should be separated from one another and embarked for unknown destinations, was a sad spectacle reserved for our times to see. . . .

These Jews are men, these Jewesses are women; these aliens are men and women. All is not permissible against them, against these men and women, against these fathers and mothers. They belong to mankind. They are our brethren as are so many others. No Christian can forget that. France, beloved motherland France, who preserves in the conscience of all her children traditional respect for the human individual; chivalrous and generous France, I do not doubt that you are not responsible for these errors.

Those who thus speak out against the policies of the Vichy government do so at the risk of their lives. Yet they are not the only ones who daily risk incurring the wrath of the Nazi tyrants by engaging in activities designed to restore France as a free nation. There are those who publish and circulate dozens of newspapers. There are the workers who slow down production in order to hamper the German war effort. There are others who engage in acts of sabotage against the invader. France today is honeycombed with secret organizations which form an immense underground movement whose sole purpose is to defeat the Nazis.

Until recently, this growing underground movement had no link with the outside world. A few weeks ago, however, an agreement was made with the de Gaulle group in London whereby all Frenchmen who oppose Hitler have formed a united front. They became the "Fighting French," rather than the "Free French," for there are many French men, women, and children who are fighting the Nazis but who are not free. Those who are fighting from within are but awaiting the arrival of help from the outside when they may rise up against the invaders. The French have refused to accept as final their defeat of two years ago.

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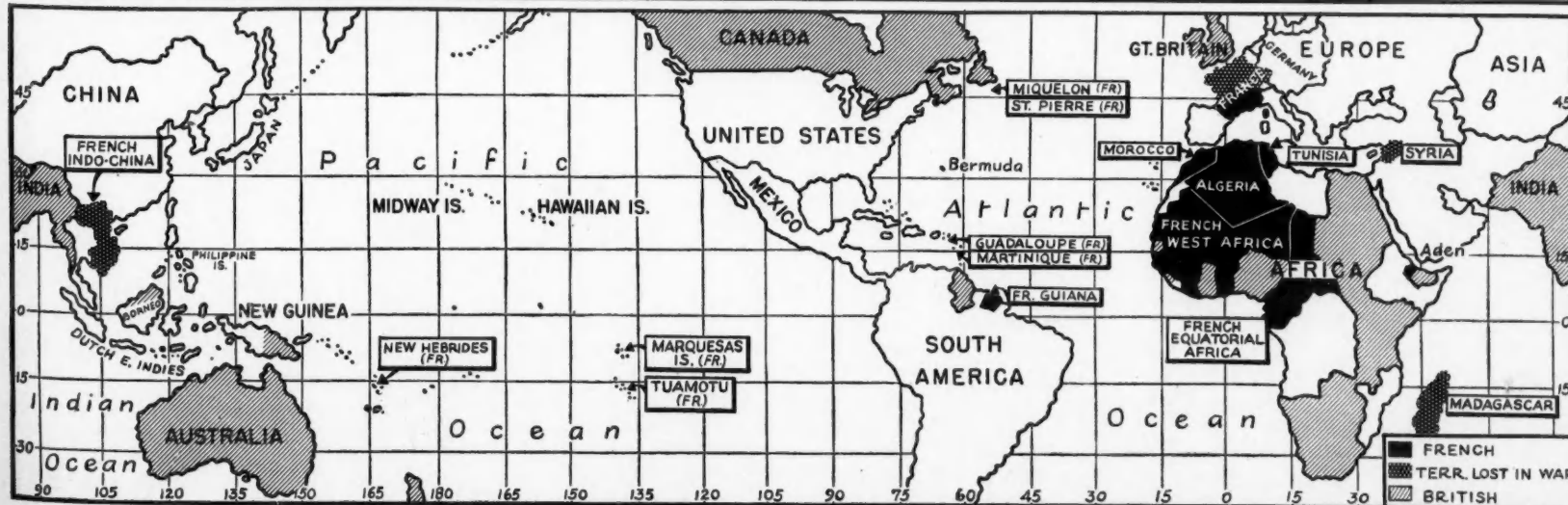
## News Quiz of the Week

(Turn to page 8, column 4, for answer key)

1. What voting restriction in certain southern states has been lifted for service men under the new law giving the absentee ballot to soldiers and sailors?
2. What prominent American recently arrived at the capital of Russia after a tour through Egypt, Turkey, and Persia?
3. Who has been appointed as the new rubber administrator?
4. Transfers and releases of government employees are now controlled by Paul V. McNutt. What is his position which gives him this authority?
5. Which of the Central American states recently frustrated an Axis plot?
6. You will soon be seeing a new coin made of 35 per cent silver, 56 per cent copper, and 9 per cent manganese. What is it?
7. Myron C. Taylor is reported to be returning to his diplomatic post in Europe. What is it?
8. Why are American steel mills running below capacity when steel is so

- badly needed for war production?
9. How does America's steel production compare to that of the rest of the world?
10. Where is most of America's iron ore located?
11. Which of these statements are true: (a) Minneapolis is 300 miles nearer to Tokyo than is San Diego, California. (b) If the Japanese were to fly as the crow would fly from Tokyo to Panama, they would pass over Denver. (c) Brazil is closer to Spain than it is to New York.
12. Which of these generals is the German commander in south Russia: (a) Feodor von Bock, (b) Erwin Rommel, (c) Karl von Rundstedt (d) Wilhelm von Leeb.
13. In India today one hears much about Pakistan. Is Pakistan (a) leader of the Hindu minority, (b) a sacred Hindu god, (c) a proposed independent Moslem state in India, or (d) Gandhi's philosophy of nonviolent resistance?







# United States Faces Steel Shortage

(Concluded from page 1)

other unnecessary construction. WPB has not only failed to plan war construction adequately, but it has failed to use its power to prevent this extravagance, to prevent overbuying and waste by both government and business. Moreover, it has had little idea of what became of most of the 85,000,000 tons of steel for which priorities have been issued in the last year.

It should be noted, however, that WPB is now trying to remedy some of these defects. It is pushing a plan to increase the nation's steel ingot capacity by 10 per cent in 1943—a very difficult task. Nelson has promised to get "hard-boiled," and has already made some changes in policy and personnel. He now intends to keep closer track of where steel is going and how it is being used, so that he can prevent extravagance and waste.

While all these are contributing reasons, the most important immediate cause of the steel situation—important because something can be done about it immediately—is the shortage of scrap iron and steel, as mentioned above. Scrap is widely used by steel mills as a raw material, and there are now only about two weeks' supply available. However, there are believed to be eight to 10 million tons of scrap going to waste all over the country, and the government is undertaking a greatly stepped-up campaign to gather in this valuable metal. As the *New York Times* pointed out, "the man or woman who contributes a pound of scrap iron is doing just as much as the miner who digs the ore for a pound of iron, or the sweating furnace worker who turns out the pig iron."

## Steel Is Power

In modern war, steel spells power. Fortunately, the United States has by far the largest steel production in the world, almost as much as all the rest of the world combined, and twice that of Germany and occupied Europe. The United States Steel Corporation alone outproduces Japan four times.

One-fourth of our output is used in essential industries serving the war, such as railroads and machinery manufacturers. The other three-fourths goes to war directly, for steel is the very backbone of war production. A medium tank, for example, requires 38 tons of steel; one of the huge 16-inch naval guns on a battleship takes 576 tons. A single Liberty ship (we are now building about 70 a month) requires 4,500 tons of rough steel, while 90 per cent of a 35,000-ton battleship is steel. Thus it is obvious why the current shortage of steel vitally affects our efforts in the war.

The making of steel is one of the most dangerous, most exciting, and most colorful of our industrial processes. The fascinating story begins in the Lake Superior region of Minnesota, Michigan, and Wisconsin, where 83 per cent of America's vast iron ore supply is found. In the famous Mesabi Iron Range of northern Minnesota, the world's largest iron deposit, the ore is so rich that after the soil and rocks are scraped away it may be dug from vast open pits with steam shovels.

The ore is shipped by rail to ore

docks on Lake Superior, principally at Duluth. Here it is dumped by chutes into the holds of specially constructed ore boats, known as "red bellies," which are flat and narrow, and as long as two city blocks.

From Lake Superior these ugly but efficient ore boats slowly plow their way to Lake Huron, and from there to South Chicago, Gary, Cleveland, and other steel centers on Lake Michigan and Lake Erie. Part of the cargoes go on overland to the great mills of Youngstown and Pittsburgh. All the ore boats—more than 300 a day—must pass through the world's busiest waterway, the famous Soo Canal between Lakes Superior and

iently found in western Pennsylvania, West Virginia, Kentucky, and southern Ohio.

At the steel mill the ore, coke, and limestone first meet in the blast furnace, a round steel shell as much as 100 feet high and lined inside with fire-resisting bricks. Little hoists run up and down the sides of this giant furnace, pouring into its hungry mouth carefully weighed amounts of raw material. Then, like something living, this huge monster breathes and sighs as terribly hot blasts of air and flame are forced up from the bottom. The coke burns and the limestone melts, removing oxygen and impurities from the ore.

of pig iron, and the more common ratio is half and half. Since scrap iron is already highly refined, its use permits much faster steel making. Moreover, every ton of scrap salvaged and used means a ton of valuable iron ore saved for the future. Thus it is obvious why shortage of scrap iron has slowed up steel production.

## Alloys Needed

In the open-hearth furnace the ore, limestone, and scrap are "cooked" for about 12 hours. If an alloy is to be produced, other special metals are added in small quantities. The "melter" in charge of the furnace takes frequent samples for testing, and the heat is carefully controlled.

At just the right time a plug is knocked out of the back of the furnace, and again a white hot, gurgling river flows into the giant ladles. The impurities float on top in the form of "slag," which is easily skimmed off. We now have real steel, which is poured into molds to form "ingots." All that remains is to form the metal into any desired shape, which is done by passing the white-hot ingot through a variety of rollers, hammers, and shears.

Pure steel is not strong enough or tough enough for many purposes, so it is usually mixed with small quantities of other metals to form alloys. Manganese is the most important, for it is added to almost all steel to "put starch in it." Nickel also adds toughness, and together with chromium makes stainless steel which resists corrosion. Tungsten and cobalt make hard tool steels which will retain a sharp edge even when red hot; molybdenum makes steel harder, longer wearing, and more heat resistant. Vanadium gives steel a fine grain.

Here again we run into a bottleneck. Molybdenum is the only one of these valuable metals which we produce in sufficient quantity. Before the war we got our tungsten from China; chromium from Africa, Turkey, and the Philippines; vanadium from Peru; nickel from Canada; manganese from Russia. Now many of these sources are completely cut off and the problem of shipping makes it difficult to reach others. Thus we are encouraging the development of our own few deposits of scarce metals, and learning ways of using smaller quantities as well as substitutes.

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## Answers to News Quiz

1. The poll tax. 2. Wendell Willkie. 3. William M. Jeffers. 4. Chairman of the War Manpower Commission. 5. Nicaragua. 6. The "nickel"—which no longer will be made with nickel. 7. President Roosevelt's personal representative to the Vatican. 8. Shortage of scrap iron and steel. 9. It is almost half the total world output. 10. In the Lake Superior region. 11. All true. 12. (a). 13. (c).



OWI PHOTO BY PALMER

**POSTER COMES TO LIFE.** This steel worker, caught by the camera beside a soldier and a sailor, symbolizes the importance of the steel industry as the backbone of the nation's war effort.

Huron. So heavy is the traffic that the Soo does more business than the Panama, Suez, and Kiel Canals combined!

In winter time the Soo becomes a bottleneck in steel production. Bitter winds make Lake Superior treacherous, and the Soo becomes heavily coated with ice. Icebreakers are used as long as possible, but from December to March the locks must be closed.

An alternate route has recently been suggested, which could be used the year round, and which could take over if the Soo were to break down or be destroyed by enemy action. The ore would be shipped overland by rail from the iron ranges to Escanaba, on upper Lake Michigan. From here it would finish its journey by ore boat, and icebreakers could keep the route clear the year round.

The other major ingredients in steel making are coke (soft coal which has been heated in ovens to drive off the gases) limestone, and scrap steel. Coking coal is conven-

Gradually the molten metal drops to the bottom of the furnace, from where it runs as a shimmering, bubbling river into huge ladles. It is now known as "pig iron," because it is sometimes cast into little molds which are said to look like small pigs.

Pig iron is of little use in itself, because it still has too many impurities. So the partly purified metal is now taken to another furnace to be converted into steel. There are several types of these furnaces. One kind melts the metal by a powerful electric current; another, the Bessemer converter, is a gigantic pear-shaped bucket which operates much like the blast furnace.

By far the most common type of converter, however, is the open hearth furnace. This is a very large, rectangular brick structure, somewhat like a huge kitchen oven, with a rounded floor. Here the molten pig iron is mixed with more limestone and with scrap iron. The open hearth furnace requires a charge of at least one ton of scrap for every two tons